

REMARKS

By the foregoing Amendment, Claims 1 and 9 have been amended. Favorable reconsideration of the application is respectfully requested.

The specification and Claim 1 have been amended to correct the spelling of the word "pressurized" as required by the Examiner. Claim 9 was also objected to as being of improper dependent form, and Claim 9 has been amended to depend from Claim 2. It is therefore believed that the Examiner's objections to the specification and claims can now be withdrawn.

Claims 1-4, 7-10, 13 and 14 were rejected under 35 U.S.C. §102(b) on the grounds of anticipation by Sato et al. (Japanese Patent Publication 60085209 A). Claim 1 recites "the first piston is configured without a passage which is both aligned with the second piston and which has a portion of constant cross-sectional area greater than the said second cross-sectional area." The Examiner indicated that this was also true of Sato et al. However, figures 6, 7 and 8 of Sato et al. clearly show a large diameter piston 21 having a bore of constant cross section D2. The small diameter piston 22 is clearly located in the bore of the piston, and is slidable within it. In order for the small diameter piston 22 to be slidable within the large diameter bore of the large diameter piston 21, the large diameter bore must clearly be aligned with and of greater cross-sectional area than the small diameter piston 22. The English language abstract of Sato et al. also describes "a small-diameter piston 22, which slides in the large diameter piston 21." The Examiner indicated that piston 21 was without such a passage, referring to passage 27 as having a

cross-section smaller than the cross-section of the second piston 22. It is accepted that this passage 27 does have a smaller cross section than the cross section of the second piston 22. However, this does not alter the fact that in Sato et al. the first piston also does have a passage excluded by Claim 1 for receiving the second piston 22. It is respectfully submitted that Sato et al. does not teach, disclose or suggest a first piston configured without a passage which is both aligned with the second piston and which has a portion of constant cross-sectional area greater than the second cross-sectional area (of the second piston) as is claimed. It is therefore respectfully submitted that Claims 1-4, 7-10, 13 and 14 are novel and inventive over Sato et al., and that the rejection of Claims 1-4, 7-10, 13 and 14 on the grounds of anticipation by Sato et al. should be withdrawn.

Claims 5, 6, 11 and 12 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Sato et al. Claims 5, 6, 11 and 12 depend from Claim 1, and it is respectfully submitted that Sato et al. does not teach, disclose or suggest a first piston configured without a passage which is both aligned with the second piston and which has a portion of constant cross-sectional area greater than the second cross-sectional area (of the second piston) as is claimed. Further in this regard, it is respectfully submitted that it is apparent that Sato et al. considers it essential the larger piston to be provided with a bore of constant cross-section larger than the cross-section of a constant cross-section part of the smaller piston, so that the smaller piston is permitted a significant range of reciprocal motion within the larger piston. The present invention goes against this arrangement, and by doing so achieves the following advantages:

1. The present invention permits an overall piston arrangement of a reciprocating mass significantly less than the masses of the prior art arrangements while permitting a large difference between the cross-sectional areas of the two pistons.

2. The present invention is easier to align the lower piston with the valve stem. When there is an annular clearance around an inner piston and also an annular clearance around an outer piston, then the axis of the inner piston is easily moved out of alignment with the valve stem. In the present invention, only one annular clearance (between the lower piston and the housing) can affect the alignment of the axis of the lower piston.

3. The present invention permits a displacement transducer to be located around the lower piston (in the housing).

4. The present invention permits a static seal between each piston and the housing (a seal statically fixed in the housing). In the prior art, a seal must be provided between two moving parts.


It is therefore respectfully submitted that Claims 5, 6, 11 and 12 are novel and inventive over Sato et al., and that the rejection of Claims 5, 6, 11 and 12 on the grounds of obviousness from Sato et al. should be withdrawn.

Applicant has reviewed the additional prior art made of record and not relied upon, and it is believed that the additional prior art made of record and not relied upon is no more pertinent than the reference actually applied. Kenchington et al. (UK Published Patent Application GB 2394000 A) is the published British Application Serial No. 0223628.9, filed October 10, 2002, from which the present application claims priority.

In light of the foregoing amendments and remarks, it is respectfully submitted that the application should now be in condition for allowance, and an early favorable action in this regard is respectfully requested.

Respectfully submitted,

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